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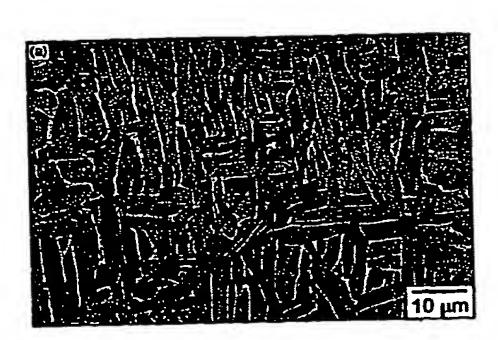
- (71) Applicant (for all designated States except US): OHIO UNIVERSITY [US/US]; 20 East Circle Drive, Sulte 190, Athens, Ohio 45701-3751 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): MIRACLE, Dr. Daniel B. [US/US]; 2237 Shadowood Circle, Bellbrook, Ohio 45305 (US). TAMIRISAKANDALA, Dr. Seshacharyulu [IN/US]; 2444 Mallard Lane, Apt. #3,

Beavercreek, Ohio 45431 (US). BHAT, Dr. Rudhakrishna B. [IN/US]; 2388 Edgewater Drive, Beavercreek, Ohio 45431 (US). TILEY, Dr. Jaimle S. [US/US]; 220 South State Street, Verona, Ohio 45309 (US).

- (74) Agent: FROST, Kristin J.; 800 Superior Avenue, Suite 1400, Cleveland, Ohio 44114-2688 (US).
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(54) Title: TITANIUM ALLOY MICROSTRUCTURAL REFINEMENT METHOD AND HIGH TEMPERATURE, HIGH STRAIN RATE SUPERPLASTIC FORMING OF TITANIUM ALLOYS



(57) Abstract: A method for refining the microstructure of titanium alloys in a single thermomechanical processing step, wherein the titanium alloy comprises boron. In some embodiments, the method comprises the steps of first adding boron to the titanium alloy then subjecting the boron-containing titanium alloy to a thermomechanical processing step. Also provided is a method for achieving superplasticity in titanium alloys comprising the steps of selecting a boron-containing titanium alloy, determining the temperature and strain rate necessary to achieve beta superplasticity, and applying sufficient temperature and strain rate to the boron-containing titanium alloy to deform the alloy to the desired shape. Also provided methods of forming titanium alloy parts and the parts prepared by these methods.

